

# iPad applications and Reading Fluency: Technology in a Title 1 Reading Classroom

Iowa State University  
Action Research Project CI 515

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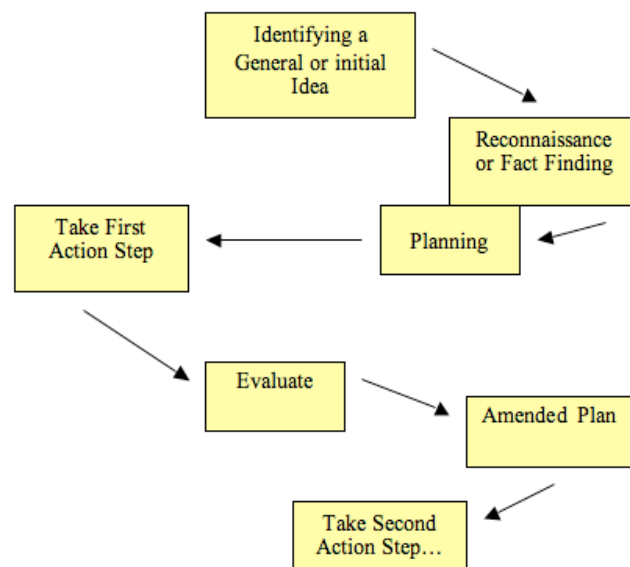
## **Introduction**

Improving each student's reading fluency is one goal of my Title 1 reading program. Each day I work with fourth and fifth grade students on their reading comprehension and fluency, and have found that instructing and assessing for comprehension is more straightforward than instructing and assessing fluency. This difference is due in part to the multiple components: rate, accuracy and prosody, that make up fluency. Currently, there is not one all-encompassing assessment or instructional method that an instructor can employ to hit all three components at one time. Instead, the teacher is left to give multiple assessments and use his or her own judgment regarding necessary instruction and materials to use to assess fluency.

In a typical small group lesson in my classroom, my students will complete a repeated reading over a selected text for the week, work on word or segment identification, and practice using appropriate phrasing, intonation and pitch while reading a passage to practice prosody. For the most part, my students know what to expect when they enter my classroom. Although their results on weekly progress monitoring assessments show improvement, I cannot help but wonder if there are alternative ways to teach fluency and allow my students to practice reading fluently.

Recently, my school district chose our school's Title 1 program to host a pilot program to integrate technology into small group lessons. Through this program I was given six iPads and told to integrate them effectively into my teaching. I began looking for ways to use the iPads in my small group instruction, but without having these new tools being the focus and drawing attention away from learning.

The action research model utilized for this project was Lewin's Action Research Spiral described by Mertler (Mertler, 2009, p. 14) and illustrated below. An area of focus was identified from initial ideas and followed by a literature review of related research. With information from previous studies and an identified area of focus, a plan was developed and included research questions, a timetable, and identification of participants and data collection materials. Next, data was collected through observations, rubrics, and performance scores. This data was analyzed and interpreted and is reported in the findings section of this paper. Finally, an action plan for future use of these findings and suggestions for future use of iPad application technology in Title 1 Reading classrooms was identified.



*Figure 1.* Lewin's action research spiral (Mertler, 2009)

### **Area of Focus Statement**

The purpose of this study is to describe the impact of using iPad applications in a 5th grade Title 1 reading classroom has on students' reading fluency, specifically the

areas of reading rate and prosody.

## **Research Questions**

Two research questions have been identified:

**How does using the iPad application *K12 Timed Reading* in a 5th grade Title 1 Reading classroom impact students' reading rate?**

**How does using the iPad application *QuickVoice* in a 5th grade Title 1 Reading classroom impact students' reading prosody?**

## **Review of Related Literature**

### **Introduction**

This literature review will focus on fluency instruction and assessment, and will examine current and past research studies related to fluency. Included research covers general information about fluency, reading rate, repeated readings and reading prosody along with methods for teaching and assessment.

### **What is Fluency?**

There are differing views among researchers and teachers about what “fluency” means. Most commonly, fluency is referred to as a combination of accuracy, rate of speed, prosody and comprehension (Deeney, 2010). With this combination, and other opinions about the composition of fluency, Iwahori (2008) provides a picture of a fluent reader by pointing out “a fluent reader is one who can read rapidly, recognize words automatically, and interpret phrases correctly” (p. 73). This illustration provides educators a mental checklist to focus on when working with students, and can loosely guide instruction related to focusing on specific elements. Traditionally, fluency is taught and practiced through repeated readings, running records or one-minute reading probes, and listening to and subsequently producing fluent reading. Reading instructors



recognize that the main way for students to become fluent is through practice and making students aware of fluency, including what fluency sounds like and discussing what specific factors of a modeled passage read aloud made it fluent (Rasinski, Homan, Biggs, 2009). Of the components that make up fluency-comprehension, rate, accuracy and prosody, reading rate, which is easily measured, will be discussed first.

### **Reading Rate**

Typically, a student's reading rate is assessed once a week through a one-minute reading test, (Deeney, 2010) with the score being recorded as the number of words per minute. The test can also include repeated readings (Morris and Gaffney, 2011) where one can score the reader's accuracy in the number of words read correctly per minute over a section of text that the student has read two to three times (Kuhn, 2004) and feels comfortable reading. In Title 1 schools, repeated readings have not only shown increases in reading rate, but students can transfer the skills from the familiar reading passage to a new and unfamiliar text (Lo, Cooke & Starling, 2011). One might consequently imagine that this repeated reading approach to be the answer to reading rate issues.

### **Repeated Readings**

Having students read familiar texts repeatedly can increase reading speed however; there can be limitations to the positive effects of repeated readings (Kuhn et al, 2010). Kuhn et al (2010), found that practice reading a text increased the automaticity (speed) a reader was able to read the text, but that the initial increase in speed was most significant in the beginning, and lessened as practice continued. While rereading a passage of text is more beneficial than going through a list of words multiple times (LeVasseur, Macaruso, & Shankweiler, 2008), there have been mixed results, including a

National Study of Title 1 Schools (Torgesen, Schirm, Castner, Vartivarian, Mansfield, Myers, & Institute of Education Sciences, 2007) where reading skills had improved, but this improvement was not realized on the state test scores. This discrepancy between teacher data and state data can cause teachers to become frustrated if they focus on only one data set. Murray, Munger, and Clonan (2012) found that while fluency data allows teachers to identify students who are not progressing at grade level with their fluency, the assessment itself does not assist the teacher in identifying the possible source of the fluency problem. Along with reading rate, reading prosody can be impacted by repeated readings, and is demonstrated by readers who are improving their fluency.

### **Reading Prosody**

Reading rate (or automaticity in younger grades) may not be the source of the problem, instead it can lie within the reader's ability to infer the phrases and author's meaning, or read prosodically (Erekson, 2010). To accurately assess students, teachers need to observe and listen to students reading (Hudson, Pullen, Lane, & Torgesen, 2009) focusing on their oral reading, making sure it sounds like speech and includes "appropriate phrasing, pause structures, stress, rise and fall patterns and general expressiveness" (Schwanenflugel, Hamilton, Kuhn, Wisenbaker, & Stahl, 2004, p. 119). Since prosody is composed of elements that cannot be assessed in the same manner as reading rate, teachers must use observations (Hudson, Lane, & Pullen, 2009) to determine when a student is reading with appropriate prosody. Several articles stress the importance of teachers or other adults modeling fluent reading to struggling readers (Lo et al., 2011; Morris et al., 2011), while Rasinski, Rikli, and Johnston (2009) take this idea one step further and suggest teachers record students reading a passage, and use a fluency

guide, for example, the Multi-Dimensional fluency scoring guide, to score the oral reading.

Rasinski et al, (2009) took prosody a step further by focusing on how it impacts comprehension. While they did not find any direct correlation between fluency and comprehension, they did find that prosody requires the reader to “attempt to understand what they read” (p. 351) This is most likely because readers must decide how to chunk the text appropriately into phrases that make sense and convey the meaning as intended by the author (Erekson, 2010). When one thinks about conversational speech, and the variety of meanings a phrase can have simply based on the tone, intonation or stress put on key words, the ideas presented about fluency influencing a reader’s comprehension appear valid although, as mentioned, no direct correlation has yet to be made. In order to work on reading fluency, instructors must have a variety of materials at their disposal. Technology can assist with locating materials, and with the adoption of iPad’s into many elementary classrooms, reading teachers can use applications from the iTunes store to work on fluency.

### **iPad Usage**

Teachers of diverse learners can utilize mobile technologies, like the iPad, in their classrooms each day. In Texas, an E.L.L. teacher has her students record themselves reading a passage using an iPod, and has found students are more willing to speak into a mobile device to record themselves, than speak up in class and risk embarrassment; thus extending the opportunity to practice speaking a language outside the classroom and spark learning or practice anytime, anywhere. (Demski, 2011)

iPads have been found to be a highly motivating and engaging tool, captivating students' attention for long periods of time. In a tutoring project for a fifth grader, reading at a second grade level, the tutor selected the iPad as the dissemination tool to work on comprehension skills and word recognition strategies. During the tutoring sessions, the iPad use included read aloud and recordable book applications, word recognition applications and completion of graphic organizers the tutor downloaded. According to the IRI assessment given at the end of the six-week tutoring project, the student had raised his reading ability by one grade level. (McClanahan, Williams & Kennedy, 2012)

Recognizing the iPad is a relatively new tool and holds the potential to differentiate content for students, additional research will need to be conducted to determine the impact this new mobile technology can have. According to Thoermer and Williams (2012), educators are being called to transition from traditional methods of teaching and move to non-traditional methods, which include using the iPad or other mobile technologies, in order to motivate students to want to read and learn.

## **Conclusion**

By reading the literature, it has become clear that teachers have many resources available to teach and assess reading rate and accuracy. These resources include instructional ideas like repeated readings (LeVasseur et al., 2008) and one-minute reading assessments (Deeney, 2010). Teachers need to decide for themselves whether they want to rely on one probe or multiple tests to classify a student as a struggling or non-fluent reader. Prosody, on the other hand, is not a concrete skill to assess through a timed or paper and pencil assessment. Rather, "prosody is the music of speech" (Erekson, 2010,

p. 80) and due to the vast meanings that can be conveyed, is best instructed through modeling and discussion (Lo et al, 2011) before using a rubric or scoring guide to assess. Ultimately, it is the teacher's goal to get students' reading to sound like everyday speech.

Noticeably lacking from the research found related to reading fluency is information regarding technology incorporation, and outside recording of a reading and playing back the results to score. Furthermore, as mentioned in several articles focusing on prosody, additional research needs to be done to create assessments that accurately assess a reader's prosody and provide a road map as to what skills need to be addressed. Finally, a consensus needs to be made regarding what fluency entails, and one assessment may not provide an accurate picture of a student's abilities and needs. While most fluency assessments focus on reading rate and accuracy, these tests leave teachers lacking an extensive view of their student's ability to read fluently (Deeney, 2010). According to Murray et al. (2012) "Unless teachers understand the complex nature of reading fluency and know how to assess and teach it, then we have failed in our efforts to provide effective and successful school experience for young readers" (p. 149) This clearly points out the multi facets, which the teacher must use when assessing a student's fluency.

### **Intervention or Innovation**

The innovation in this action research project was to observe and collect fluency data from fifth grade students whom have been identified as students needing tier 2 response to intervention (RTI) instruction based on reading probes (BRI, DIBELS DAZE and ORF). During small group instruction, students used the iPad applications *QuickVoice* and *K12TimedReading* for fluency practice as they worked on their reading rate and prosody. Students were given multiple opportunities to record themselves

reading a passage and while listening to the playback, rate their prosody using the “Fluency Reading Rubric” and timing their reading before taking their weekly fluency progress monitoring assessment. All scores including cold and hot reads, student self-evaluation fluency scores and teacher fluency evaluation were collected.

This fluency project will assist reading teachers and RTI Tier 2 and 3 instructors in selecting a digital tool to impact their fluency instruction. With a variety of technology tools available, two iPad applications were focused on with the goal of showcasing their use in small group fluency lessons, and provide teachers a springboard from which to mold this technology into a tool useful for their own instructional needs. Further research will be conducted to identify additional applications for fluency instruction as well as expanding the search into reading comprehension, with the intent of creating student centered reading activities for RTI students.

### **Membership of the AR Group**

This action research project took place in a single section Title 1 elementary school located within a large school district in Iowa. The school has a fifty-seven percent free and reduced lunch population, nominated for the Iowa 2011 Blue Ribbon School award, and is in the process of becoming a 1:1 iPad (K-3) and laptop (4-5) school. The district includes eight elementary schools, two middle schools and one high school, serving just over 6,000 students. The enrollment of the fifth grade class from which the participants were selected is 31 students.

Participants in this study include four students, three girls and one boy, all of low socio-economic status, who were placed in Title 1 Reading based on their reading scores on fifth grade reading assessments including the BRI, DIBELS DAZE and DIBELS

DORF. Instruction for these students focused primarily on improving reading fluency during two weekly twenty-minute small group sessions. The researcher is also the Title 1 reading instructor, and the Title 1 classroom was selected as part of an iPad pilot program and currently has six iPads to integrate into instruction. Some students were familiar with iPad technology prior to the study, but used it primarily for gaming or social media rather than reading or fluency practice. All students had participated in traditional fluency instruction consisting of weekly progress monitoring through cold and hot readings, words correct per minute scoring of a one-minute passage reading, and teacher scoring of fluency using a teacher created fluency rubric.

### **Negotiations to be undertaken**

Before this project began, my colleague was briefed about the purpose of the study, scheduling concerns and the timeframe of the project. This was done to insure students did not miss small group instruction time due to classroom obligations, and so the classroom teacher could support the fluency skills being worked on in the Title 1 classroom.

### **Timeline**

- Phase 1: (January-February 2012) Identified area of focus, developed research questions, reviewed related literature, and identified students.
- Phase 2: (March 2012) Data collected
- Phase 3: (April 2012) Data analyzed, findings reported, action plan developed based on findings.

## Date collection and analysis

### Data collection

Data collection was conducted during phase 2 of the action research project, and Table 1 illustrates the research questions and the data sources used to answer each question.

Table 1  
*Research Questions and Data Sources*

Question	Data Source
1. How does using the iPad application <i>K12 Timed Reading</i> in a 5th grade Title 1 Reading classroom impact students' reading rate?	QuickRead timed tests, teacher observations, iPad application timed reading
2. How does using the iPad application <i>QuickVoice</i> in a 5th grade Title 1 Reading classroom impact students' reading prosody?	Teacher observation, iPad application recording, Self evaluation using fluency rubric

Participants in this two-week data collection process began the first week with no change in routine. This is because the teacher researcher wanted to gather baseline data without the iPad application innovation, which would allow comparison and analysis of the data to occur at the end of data collection. The first day, a cold read, the first reading of an unfamiliar passage, was taken and the students score was recorded (See Table 2) as words correct in one minute as well as the time it took students to read the entire passage. Once the initial score is recorded, students read through the passage together, noting any inaccurate words said during the cold read. Repeated readings occur on the subsequent meetings that week along with other skill work outside the realm of this research project. One week after the cold read, students again are given the one-minute QuickRead, and this score is recorded as the hot read score, finishing out this week's fluency reading.



The next week, the innovation is introduced to students and because all the iPads have been set up with a particular student's information, the student is assigned their iPad number and learns how to access and use each application. The teacher researcher explains the goal of integrating the iPad applications into the weekly fluency practice. Students have used the iPads in Title 1 Reading before, but typically as a reading center activity where they play word games, practice grammar skills or read e-books; so it was important students recognize the purpose of using the iPads during the fluency practice and did not view this use as a game or time to compete with peers. Once the technology introduction was complete, students were given the new QuickRead passage for the week, and the teacher administered the one-minute timed reading fluency assessment, and read through the passage with the student to address any errors made during the initial reading.

Throughout the week, students reread the passage, working to improve their words per minute score, used the iPad application *K12 Timed Reading* to work on transferring their reading rate to new passages (see Appendix A), with the ultimate goal of improving their reading rate to the point it sounded like normal conversational speech. To ensure students did not view the exercise as solely getting to the end of the passage as quick as possible, which would impact comprehension, the teacher observed and discussed the purpose of practicing repeated readings, modeled the desired reading rate, and recorded all observations on the teacher observation sheet (see Appendix B). At the end of the week, students reread the now familiar passage for a final time. Their hot read scores were recorded, and can be seen in Table 2.

Table 2

*Words Correct Per Minute (WCPM) Pre Innovation Cold/Hot and Post Innovation Cold/Hot Readings*

Student	Pre Innovation Cold Reading	Pre Innovation Hot Reading	Post Innovation Cold Reading	Post Innovation Hot Reading
1	83	96	71	138
2	102	122	103	159
3	86	114	98	142
4	80	100	108	128

Data for question 2 was collected during the second week, and gathered through student self evaluations using the fluency rubric tool (see Appendix C) and the self-evaluation sheet (see Appendix D). During this time, students recorded themselves reading the QuickRead passage using the *QuickVoice* application, and while playing back the recording, filled out the self evaluation sheet (see Appendix E) by rating their prosody (expression and phrasing) using the fluency rubric. As with question 1, it was important that students understood the purpose of practicing reading with prosody, so teacher observations were also used as a data source and were recorded on the teacher observation sheet (see Appendix B). Once collected, the teacher observations and prosody scores were compiled together (see Table 3). Students also provided student reflection scores (see Appendix E).

Table 3  
*Teacher Scores and Observations on Student Prosody*

Student	Before Innovation	After Innovation	Observations
1	2	3	<u>Read 1</u> : Student is using good phrasing but lacks expression and vocal inflections. Goal for next time is to pay attention to punctuation and draw cues for expression from the passage. <u>Read 2</u> : Prosody has improved based on increased expression and inflection. I would still like this student to pay attention to phrasing.
2	1	3	<u>Read 1</u> : Reading is very monotone and choppy, told student to read the passage like they are talking to a friend <u>Read 2</u> : Reading has expression, but still needs to work on phrasing
3	2	4	<u>Read 1</u> : Showed expression in parts of the passage but lacks phrasing as evident by reading word by word. <u>Read 2</u> : Oral reading sounded like one would have in a typical conversation-very expressive! Reader paid attention to phrasing throughout the entire passage.
4	2	3	<u>Read 1</u> : Has some expression and connected phrases while reading. Goal for hot read-listen to self reading and think about how it would sound if a narrator of a movie read it. <u>Read 2</u> : The reader's expression has vastly improved, and is expressive during most of the passage. Phrasing has improved as well.

### Data analysis

To analyze the data shown in Table 1, related to question one, paired T-tests were conducted using SPSS. This allowed the quantitative data of the pre-innovation cold reads to be compared with the post-innovation cold read; as well as the pre-innovation hot read with the post-innovation hot read. The cold and hot read data represents the change based on the innovation, and allowed the teacher researcher to get an accurate picture as to what impact the timed reading practice had on reading rate. Analysis of the K12 Timed Reading application data from Appendix A was done using T-test, general linear model and ANOVA test in order to compare the three reading trials students

completed. The comparison was done by focusing first on trials 1 and 2, then trials 2 and 3, and finally, 1 and 3; allowing the data from each to be looked at and determine what impact the innovation had on students' reading rate. This was compared to the results of the other tests done on Appendix A.

The data presented in question 2 is more qualitative in nature. Because of this, no hard analysis of the data was conducted. Rather trends were looked for in the data found in appendix E, and reinforced in teacher observations located in table 3.

## **Findings**

Based on the paired t-tests used to analyze the data from table 2 as well as appendix A, it was found that using the iPad application *K12 timed reading* did increase the students' correct words per minute between the before intervention hot read and after intervention hot read (see Appendix F). Due to the nature of what this measures, this could be due to either an increase in accuracy or reading rate.

Overall, reading rate, the focus of this question, did not increase in a way attributable to the use of K12 timed reading (see Appendix G), but there was an increase in accuracy. The analysis indicates that there is a significant difference between the pair of trial 2 and trial 3. The ANOVA indicates that the means are most likely unequal; however, the lack of sphericity means that the results of the ANOVA may not be reliable. Additionally, the modeling indicates that any difference in the means is either caused by a parabolic increase in reading rates (which is unlikely given experimenter observation in other contexts) or a third factor. It should be noted there was no increase in the correct words per minute reading rate between the before intervention cold read and after

intervention cold read, most likely due to the fact that the reading passage was new and unfamiliar each time.

Given all of the above, it is therefore most likely that reading rate stayed even while reading accuracy did increase. Because an increase in accuracy was outside the realm of this research project, further tests are necessary to draw any definitive correlations between using the *K12 timed reading* application and an increase of reading accuracy.

As mentioned in the analysis section, the data for question two was more qualitative in nature and used teacher observations and student self-evaluations to determine what impact recording an oral reading of a passage a passage using Quick voice, and then playing back the recording and evaluate using a fluency rubric has on reading prosody. Looking at table 3, one sees the teacher's observational comments and that each student shows improvement in their usage of phrasing and expression, two components of prosody. Along with the comments, the rubric score identified in the table also shows improvement in reading prosody as well. Students also identified an improvement in their reading prosody through their responses to the self-reflection evaluation information found in Appendix E. Most notable, and unable to be presented in this paper, is the audible difference one can perceive between each trial's recording. The amount of vocal inflection students use when they know they are being recorded and will be playing the reading back increases, to the point their reading sounds like normal conversational speech. Therefore, it can be concluded that the *QuickVoice* application did impact reading prosody and increase students' awareness and use of expression and phrasing when reading familiar passages.

## **Action Planning**

The action research in this project shows promise for using iPad applications such as *QuickVoice* and *K12 Timed Reading* in the Title 1 reading classroom. The fifth grade participants had improvements in their reading rate, prosody, and accuracy. The next step related to the action research project includes sharing the findings with colleagues in my building who also teach reading including the special education teacher, lower elementary teachers and fellow Title 1 Reading teacher. These two applications will also be used with my fourth grade fluency group, in hopes their fluency will improve to at or above grade level.

Outside the two applications identified in this project, the search is on for an application that allows a teacher to input their own reading passages, times students as they read them, and either reads the passage or allows students to record themselves reading the passage. This would reduce the amount of paper shuffling, steps students take to practice their fluency, and would allow students to be more independent in improving their fluency in and out the Title 1 classroom.

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## **Appendices**

## **Appendix A- K12 Timed Reading Scores**

Student	Trial 1	Trial 2	Trial 3
1	1:32	1:27	1:17
2	1:06	1:07	1:04
3	1:12	1:10	1:05
4	1:21	1:20	1:15

## Appendix B- Teacher Observation Sheet

### Teacher Observations: Fluency

Date: \_\_\_\_\_ Name: \_\_\_\_\_

Expression 4 3 2 1

Comments: \_\_\_\_\_

Things to work on: \_\_\_\_\_

Phrasing 4 3 2 1

Comments: \_\_\_\_\_

Things to work on: \_\_\_\_\_

Accuracy 4 3 2 1

Comments: \_\_\_\_\_

Things to work on: \_\_\_\_\_

Rate 4 3 2 1

Comments: \_\_\_\_\_

Things to work on: \_\_\_\_\_

Goal for next time: \_\_\_\_\_

Date: \_\_\_\_\_

Expression 4 3 2 1

Comments: \_\_\_\_\_

Things to work on: \_\_\_\_\_

Phrasing 4 3 2 1

Comments: \_\_\_\_\_

Things to work on: \_\_\_\_\_

Accuracy 4 3 2 1

Comments: \_\_\_\_\_

Things to work on: \_\_\_\_\_

Rate 4 3 2 1

Comments: \_\_\_\_\_

Things to work on: \_\_\_\_\_

Date: \_\_\_\_\_

Expression 4 3 2 1

Comments: \_\_\_\_\_

Things to work on: \_\_\_\_\_

Phrasing 4 3 2 1

Comments: \_\_\_\_\_

Things to work on: \_\_\_\_\_

Accuracy 4 3 2 1

Comments: \_\_\_\_\_

Things to work on: \_\_\_\_\_

Rate 4 3 2 1

Comments: \_\_\_\_\_

Things to work on: \_\_\_\_\_

Goal for next time: \_\_\_\_\_

Scoring:

Cold Read:

Date: \_\_\_\_\_

Expression \_\_\_\_\_

Phrasing \_\_\_\_\_

Accuracy \_\_\_\_\_

Rate \_\_\_\_\_

Hot Read:

Date: \_\_\_\_\_

Expression \_\_\_\_\_

Phrasing \_\_\_\_\_

Accuracy \_\_\_\_\_

Rate \_\_\_\_\_

Comments: \_\_\_\_\_

## Appendix C-Fluency Rubric

# Fluency Reading Rubric

	4	3	2	1	0
<b>Expression</b>	Very expressive throughout the entire selection	Expression throughout most of the selection	Some expression in parts of the selection	Very little expression	Not Yet
<b>Phrasing</b>	Meaningful phrasing throughout the entire selection	Some phrasing; pays attention to punctuation	Phrases known expressions; rest are word-by-word	Mostly word-by-word; pauses at end punctuation	Not Yet
<b>Rate</b>	Greater than 110 words per minute	90-110 words per minute	70-90 words per minute	Less than 70 words per minute	Less than 50 words per minute
<b>Accuracy</b>	96-100% accurate	90-95% accurate	86-89% accurate	Under 85% accurate	Under 60% accurate

## Appendix D- Student Self Reflection Sheet

Name:

Date:

Use the fluency rubric to rate your reading of the passage.

Expression 4 3 2 1 Because:

Phrasing 4 3 2 1 Things to work on:  
Because

Things to work on:

Accuracy 4 3 2 1 Because:

Things to work on:

Rate 4 3 2 1 Because:

Things to work on:

Goal for next time:

Date:

Use the fluency rubric to rate your reading of the passage.

Expression 4 3 2 1 Because:

Phrasing 4 3 2 1 Things to work on:  
Because

Things to work on:

Accuracy 4 3 2 1 Because:

Things to work on:

Rate 4 3 2 1 Because:

Things to work on:

Goal for next time:

Date:

Use the fluency rubric to rate your reading of the passage.

Expression 4 3 2 1 Because:

Phrasing 4 3 2 1 Things to work on:  
Because

Things to work on:

Accuracy 4 3 2 1 Because:

Things to work on:

Rate 4 3 2 1 Because:

Things to work on:

Goal for next time:

### Peer Scoring

Date:

Choose a friend to do the following:

-Listen to one of your recordings of this week's passage

-Fill out your fluency rating sheet in this box

-Give you suggestions/feedback for next time

Score your friend's reading:

Expression 4 3 2 1 Because:

Phrasing 4 3 2 1 Because

Accuracy 4 3 2 1 Because:

Rate 4 3 2 1 Because:

Suggestions/Ideas to improve:

1 positive comment:

## Appendix E- Student Self Reflection Scores

### Fluency Rubric Scores (Student Self Evaluation)

Key: (E) Expression (P) Phrasing (R) Rate (A) Accuracy

Student	Reading 1				Reading 2				Reading 3			
	E	P	R	A	E	P	R	A	E	P	R	A
1	2	3	3	2	3	3	3	2	4	4	3	3
2	3	2	3	2	3	3	3	4	4	4	4	4
3	2	2	3	3	3	2	3	3	3	3	4	4
4	2	2	2	2	2	3	3	3	3	3	4	4

## Appendix F-Statistical Test for Table 2 Data

### T-Test (SPSS)

*Paired Samples Statistics*

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	BICR	87.7500	4	9.81071	4.90535
	BIHR	108.0000	4	12.11060	6.05530
Pair 2	AICR	95.0000	4	16.51262	8.25631
	AIHR	141.7500	4	12.91962	6.45981
Pair 3	BICR	87.7500	4	9.81071	4.90535
	AICR	95.0000	4	16.51262	8.25631
Pair 4	BIHR	108.0000	4	12.11060	6.05530
	AIHR	141.7500	4	12.91962	6.45981

*Paired Samples Correlations*

		N	Correlation	Sig.
Pair 1	BICR & BIHR	4	.864	.136
Pair 2	AICR & AIHR	4	.078	.922
Pair 3	BICR & AICR	4	.251	.749
Pair 4	BIHR & AIHR	4	.848	.152

*Paired Samples Test*

		Paired Differences				
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference	
					Lower	Upper
Pair 1	BICR - BIHR	-20.25000	6.13052	3.06526	-30.00503	-10.49497
Pair 2	AICR - AIHR	-46.75000	20.15564	10.07782	-78.82213	-14.67787
Pair 3	BICR - AICR	-7.25000	16.95828	8.47914	-34.23441	19.73441
Pair 4	BIHR - AIHR	-33.75000	6.94622	3.47311	-44.80299	-22.69701

*Paired Samples Test*

		t	df	Sig. (2-tailed)
Pair 1	BICR - BIHR	-6.606	3	.007
Pair 2	AICR - AIHR	-4.639	3	.019
Pair 3	BICR - AICR	-.855	3	.455
Pair 4	BIHR - AIHR	-9.718	3	.002

## Appendix G- Statistical Tests for Appendix A Data

### T-Test (SPSS)

*Paired Samples Statistics*

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Trial1	77.7500	4	11.32475	5.66238
	Trial2	76.0000	4	9.20145	4.60072
Pair 2	Trial2	76.0000	4	9.20145	4.60072
	Trial3	70.2500	4	6.70199	3.35099
Pair 3	Trial1	77.7500	4	11.32475	5.66238
	Trial3	70.2500	4	6.70199	3.35099

*Paired Samples Correlations*

		N	Correlation	Sig.
Pair 1	Trial1 & Trial2	4	.992	.008
Pair 2	Trial2 & Trial3	4	.978	.022
Pair 3	Trial1 & Trial3	4	.945	.055

*Paired Samples Test*

		Paired Differences				
					95% Confidence Interval of the	
					Difference	
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper
Pair 1	Trial1 - Trial2	1.75000	2.50000	1.25000	-2.22806	5.72806
Pair 2	Trial2 - Trial3	5.75000	2.98608	1.49304	.99848	10.50152
Pair 3	Trial1 - Trial3	7.50000	5.44671	2.72336	-1.16693	16.16693

*Paired Samples Test*

		t	df	Sig. (2-tailed)
Pair 1	Trial1 - Trial2	1.400	3	.256
Pair 2	Trial2 - Trial3	3.851	3	.031
Pair 3	Trial1 - Trial3	2.754	3	.071

### Repeated Measures ANOVA (VassarStats)

Source	SS	df	MS	F	P
Treatment	123.1667	2	61.583	8.24	0.019014
Error	44.8333	6	7.472		



## General Linear Model Tests (SPSS)

### Multivariate Tests<sup>b</sup>

Effect		Value	F	Hypothesis df	Error df	Sig.
TrialNumber	Pillai's Trace	.974	37.070 <sup>a</sup>	2.000	2.000	.026
	Wilks' Lambda	.026	37.070 <sup>a</sup>	2.000	2.000	.026
	Hotelling's Trace	37.070	37.070 <sup>a</sup>	2.000	2.000	.026
	Roy's Largest Root	37.070	37.070 <sup>a</sup>	2.000	2.000	.026

a. Exact statistic

b. Design: Intercept

Within Subjects Design: TrialNumber

### Mauchly's Test of Sphericity<sup>b</sup>

Measure: MEASURE\_1

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.
TrialNumber	.019	7.937	2	.019

### Mauchly's Test of Sphericity<sup>b</sup>

Measure: MEASURE\_1

Within Subjects Effect	Epsilon <sup>a</sup>		
	Greenhouse-Geisser	Huynh-Feldt	Lower-bound
TrialNumber	.505	.512	.500

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

a. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

b. Design: Intercept

Within Subjects Design: TrialNumber

*Tests of Within-Subjects Effects*

Measure: MEASURE\_1

Source		Type III Sum of Squares	df	Mean Square
TrialNumber	Sphericity Assumed	123.167	2	61.583
	Greenhouse-Geisser	123.167	1.010	122.002
	Huynh-Feldt	123.167	1.024	120.283
	Lower-bound	123.167	1.000	123.167
Error(TrialNumber)	Sphericity Assumed	44.833	6	7.472
	Greenhouse-Geisser	44.833	3.029	14.803
	Huynh-Feldt	44.833	3.072	14.595
	Lower-bound	44.833	3.000	14.944

*Tests of Within-Subjects Effects*

Measure: MEASURE\_1

Source		F	Sig.
TrialNumber	Sphericity Assumed	8.242	.019
	Greenhouse-Geisser	8.242	.063
	Huynh-Feldt	8.242	.062
	Lower-bound	8.242	.064

*Tests of Within-Subjects Contrasts*

Measure: MEASURE\_1

Source		TrialNumber	Type III Sum of Squares	df	Mean Square	F	Sig.
TrialNumber	Linear		112.500	1	112.500	7.584	.071
	Quadratic		10.667	1	10.667	96.000	.002
Error(TrialNumber)	Linear		44.500	3	14.833		
	Quadratic		.333	3	.111		

*Tests of Between-Subjects Effects*

Measure: MEASURE\_1

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	66901.333	1	66901.333	275.440	.000
Error	728.667	3	242.889		